Database of Severe Storms and Natural Catastrophes: Assessing Naval Applications

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MM - Site Visit Report News Headlines Sharing of database of past catastrophic events may benefit port guides for U.S. Navy ships and risk analysis for insurance company.

INTRODUCTION

ONRIFO Adjunct Scientist Joe Cannon conducted an S&T liaison visit to Munich Reinsurance Company in support of the Naval Research Laboratory's Severe Weather Port Guide. The guide (http://www.nrlmry.navy.mil/~cannon/medports/index.html) provides decision-making guidance for U.S. Navy ship captains. The Geo Risks Research Department maintains literature, reports, and CDROM on worldwide natural catastrophes including statistics on windstorms, tropical cyclones, regional storms, storm surges, high waves, heavy rain, hailstorms, tornados, tsunamis, volcanic eruptions, and other geophysical parameters. The department has a team of staff and university students that gather data on event occurrences through the Internet, newspapers, and other public resources. The data is maintained on an internal GIS database server. Statistical analysis tools are run against the data. One of the outputs includes percentages of potential risks for a given catastrophe for a given geographical region. Sharing of database of past catastrophic events, and access to valuable global statistics on windstorms, tropical cyclones, extratropical storms, regional storms, monsoon storms, storm surges, high waves, heavy rain, hailstorms and Lighting, tsunamis, volcanic eruptions and other geophysical parameters, may benefit port guides for U.S. Navy ships and risk analysis for

insurance company. This Newsletter is designed to inform national and international scientists, research and governmental institutions and international organizations about potential research collaboration.

LONG TERM GOALS

The long-term goal is to ensure all available data and useful databases characterizing severe weather are included in the Severe Weather and Port Studies Handbook to provide U.S. Navy Unit Commanders with a decision aid that could potentially mitigate severe storm damage to ship and shore facilities, and save lives.

OBJECTIVE

The objective of the Liaison visit was to ascertain data sharing possibilities.

APPROACH

ONRIFO provided an overview of the Severe Weather and Port Guide. The Port Guide focuses on the following information for each port:

- Analysis of the port as a haven for ships
- weather hazards for each meteorological season and impact for ships pierside, at anchor, or transiting.
- mitigating measures
- port charts and pictures
- Internet links to other Sites containing real-time forecasting and observations.

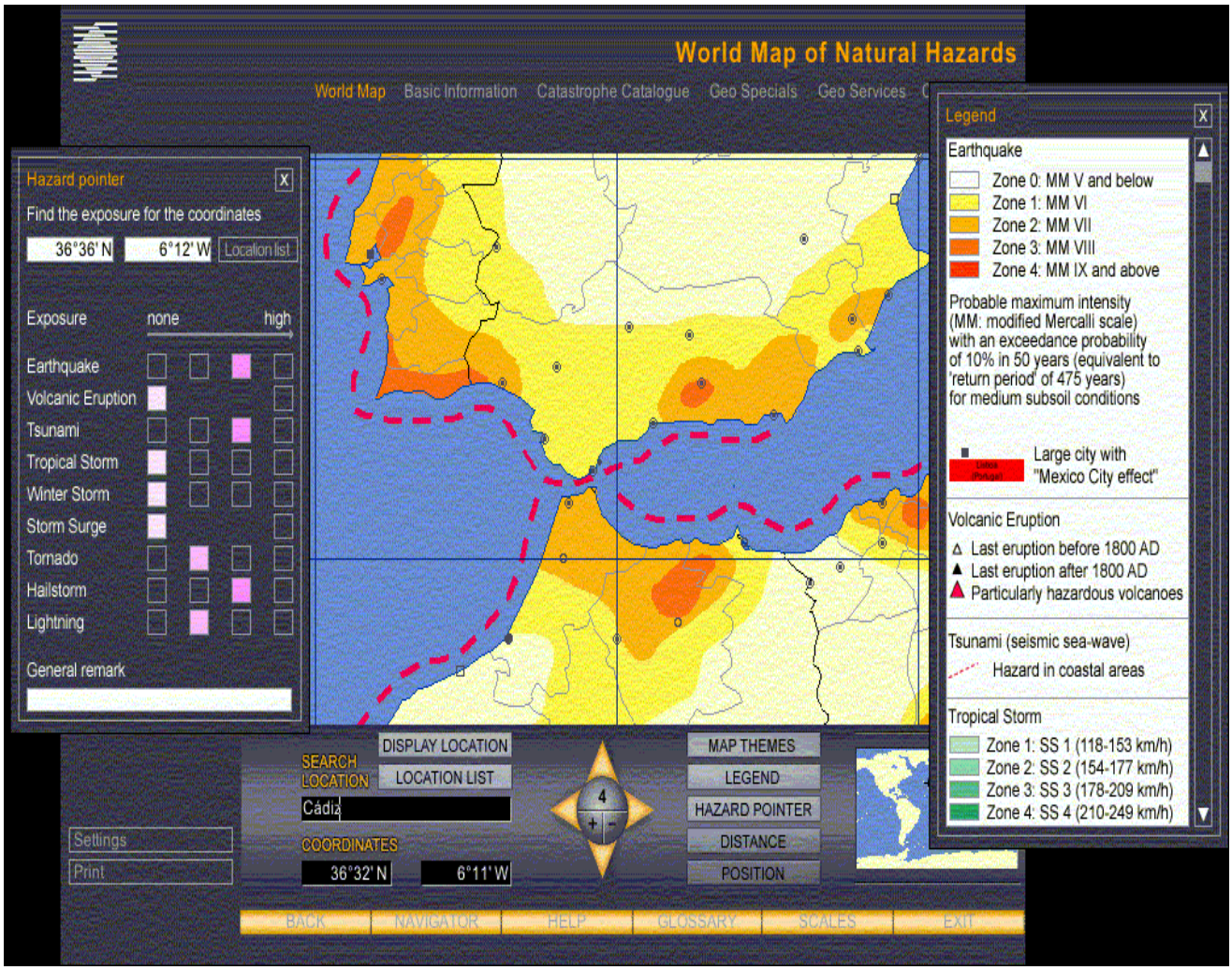
The Geo Risks Research Department provided the following resources:

- Dr Jurgen Schimetschek (jschimetschek@munichre.com) provided a demonstration of the World of Natural Hazards CDROM containing the following information as of 2000:
    - a world map of natural hazards with a comprehensive list of locations
    - for any point on earth, identification of potential natural hazards
    - a worldwide catalogue of catastrophes with various criteria for selection and cartographic presentation
    - a country-by-country database with national statistics and an overview of relevant natural hazards
    - a glossary of important geoscientific and insurance terminology
    - earthquake and storm scales with a unit converter for frequently used parameters

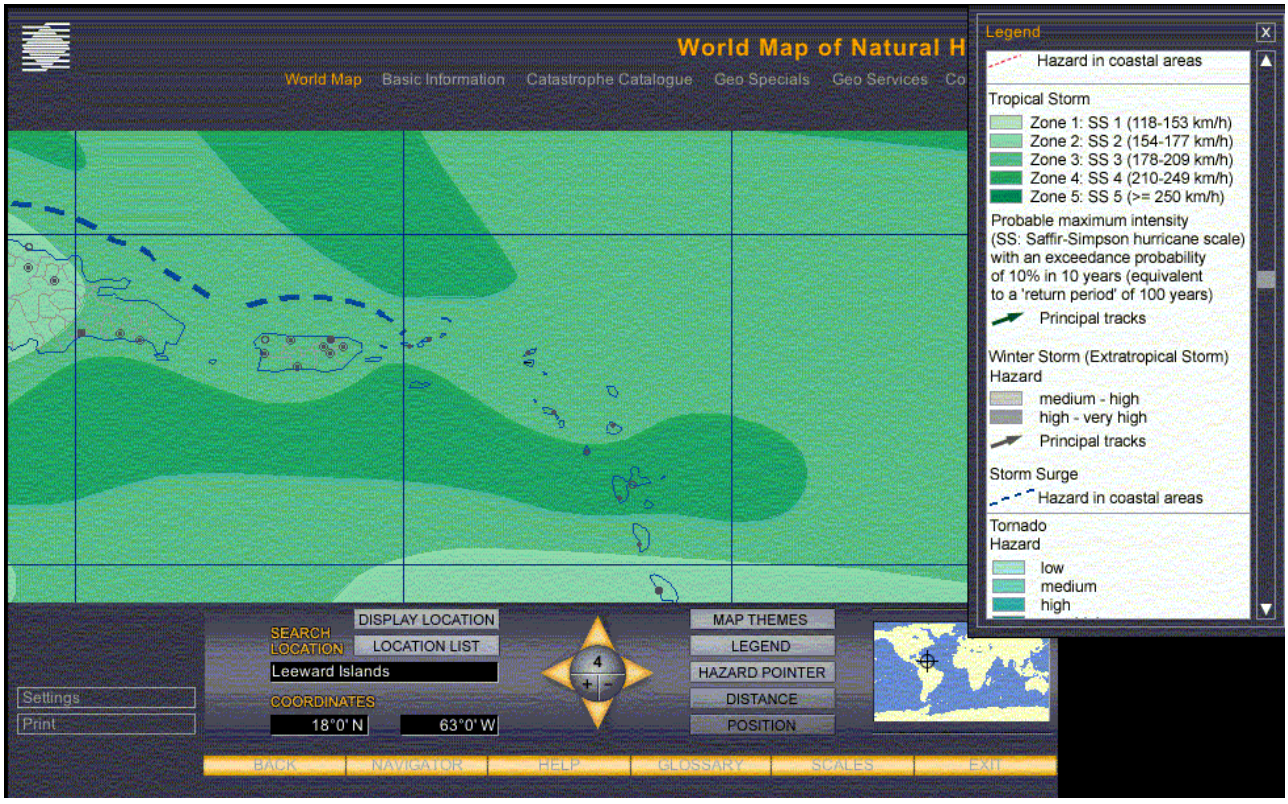
- Publications containing breathtaking pictures, statistical charts and graphs, and text descriptions. These include:
    - Annual Reviews of Natural Catastrophes
    - Winter storms in Europe - 1999
    - Earthquake Seattle (USA) on 28.02.2001
    - Flooding in central and eastern Europe August 2002
    - 94 total publications available

All publications, including back issues, posters, and charts are available from the Web Site http://www.munichre.com/default_e.asp - click on Current Publications at the right.

Below are examples of data from the World of Natural Hazards CDROM:



Earthquake and Tsunami probabilities for southern Spain. The legend box at left is data for a specific city – in this case - Cadiz, Spain.



Storm and storm surge probabilities for the Caribbean Leeward Islands.

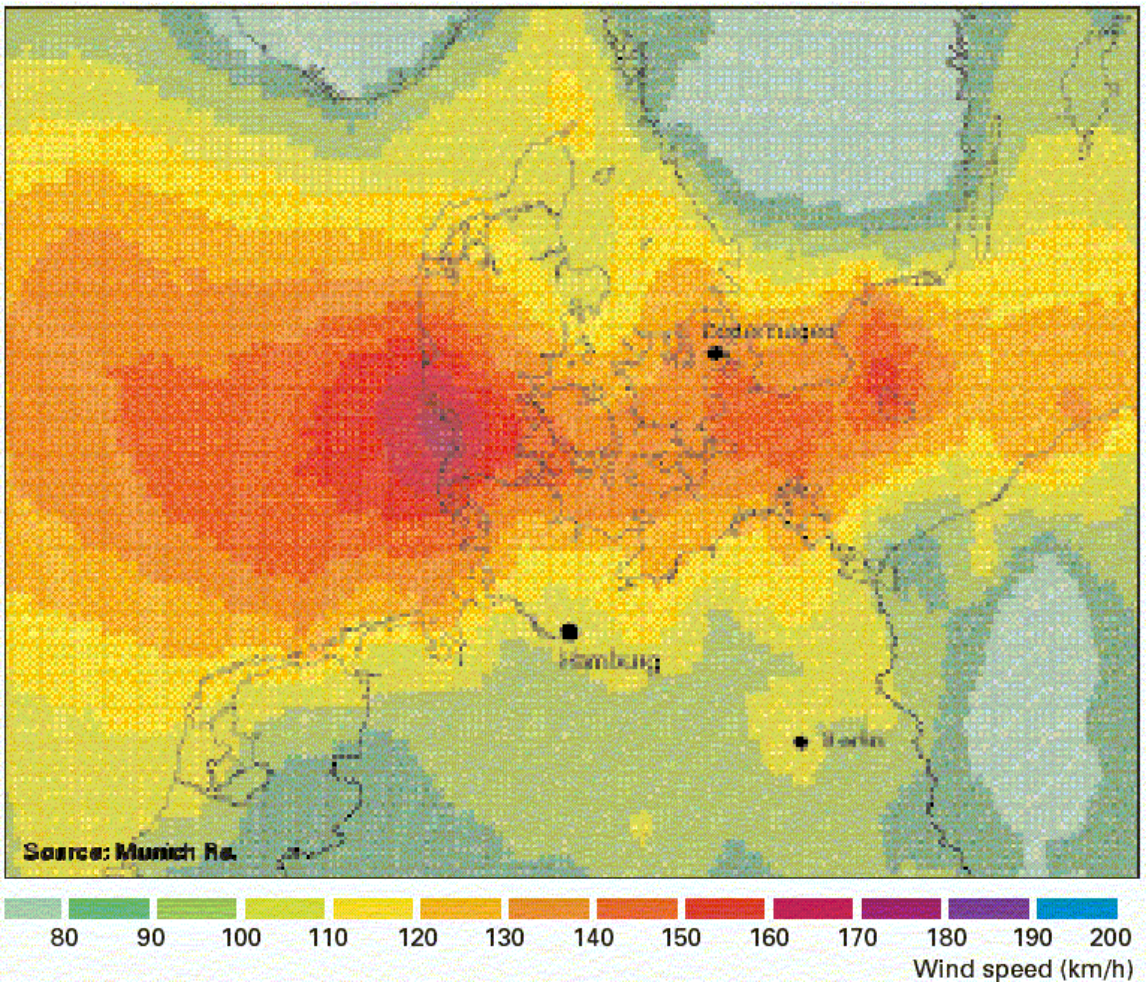
ASSESSMENT/POTENTIAL COLLABORATION

There is some potential for sharing of data. The Geo Risk Research Department can use the online Port Guide and Hurricane Haven handbooks as:

- an additional resource for the collection of hazardous events
- as a resource to address risk advisability when called by insurance underwriters.

We can consider adding information such as the two figures above to the Port Guides or Hurricane Haven Handbooks.

More importantly, Geo Risks Research Department has some interesting data on 54 severe storm tracks to hit Europe over the past 35 years. For each of these storms, a meteorological wind field was produced based on the location and central pressure of the storm track. An excellent study for 3 severe storms in 1999 are presented in the booklet "Winter Storms in Europe (II)" available on the Web (http://www.munichre.com/default_e.asp). A request has been made to obtain data for the other storm tracks.



Example of a wind field plot for 1999 severe storm Anatol.

The one challenge regarding data collaboration between insurance holdings and U.S. Navy databases is the differing geographic area size focus. The focus of the Geo Risks Department is for catastrophes occurring on a large geographic scale, perhaps affecting a large population center or area. The focus of the Port Guides is smaller scale, covering harbors, piers and anchorages. An emphasis of the Guides is capturing local hazardous weather events as described by local pilots and harbormasters. Future collaboration in data sharing recommended. Knowledge of the frequency and location of global natural disasters, severe weather hot-spots and geography risk could alert our Navy ships and shore assets. Access to storm tracks along the coast, and verification/validation of holdings, will ensure the latest available severe weather data is available to the Fleet.

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